

UNITED STATES DISTRICT COURT
FOR THE
DISTRICT OF VERMONT

U.S. DISTRICT COURT
DISTRICT OF VERMONT
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RICHARD GRAJEDA,

Plaintiff,

v.

Case No. 2:20-cv-00165

VAIL RESORTS INC., VAIL RESORTS
MANAGEMENT COMPANY, and OKEMO
LIMITED LIABILITY COMPANY d/b/a/
OKEMO MOUNTAIN RESORT,

Defendants.

**ORDER GRANTING IN PART AND DENYING IN PART PLAINTIFF'S
MOTION TO EXCLUDE DEFENDANTS' EXPERT IRVING SCHER, PHD
(Doc. 85)**

Plaintiff Richard Gajeda brings this negligence action against Vail Resorts Inc., Vail Resorts Management Company, and Okemo Limited Liability Company (collectively, "Defendants"), seeking damages for injuries he sustained in a collision while skiing at Okemo Mountain Resort ("Okemo"). Pending before the court is Plaintiff's May 18, 2022 motion to exclude Defendants' biomechanical engineering expert Irving Scher, Ph.D., P.E. ("Dr. Scher"). (Doc. 85.) Defendants opposed the motion on July 28, 2022 (Doc. 102), and Plaintiff replied on August 17, 2022. (Doc. 107.) The court held a hearing on the motion on September 27, 2022 and evidentiary hearings on January 13, 2023 and March 10, 2023 at which Dr. Scher testified.

Plaintiff is represented by Andrew J. Smiley, Esq., Guy I. Smiley, Esq., and Matthew D. Anderson, Esq. Defendants are represented by Kristen L. Ferries, Esq., Craig R. May, Esq., Habib Nasrullah, Esq., Joel P. Iannuzzi, Esq., and Thomas P. Aicher, Esq.

I. Factual Background.

On December 19, 2019, Plaintiff fell while downhill skiing with friends at Okemo on "Open Slope," which is a beginner trail. At the time, there were no issues with

visibility, but the weather was cold and the snow conditions were icy. Plaintiff had skied twice before, approximately seven years prior, and considered himself to be a beginner skier.

On his second ski run that morning, Plaintiff rode the B Quad chair lift to a ski trail called “Lower Mountain Road.” As he approached the lower section of the ski trail, he encountered a group of ski school students crossing the trail in front of him. Plaintiff saw the group when they were fifteen to twenty feet ahead of him and veered to the left to avoid them. As he did so, he hit an icy patch and fell onto his left hip. His skis came off and he slid down the ski trail on his left side and then on his stomach. Plaintiff’s head and shoulders faced uphill as he slid, so that he could not see where he was sliding. He testified in deposition: “As I was sliding, [I] felt a dip in the snow, and then I went under something, and I slammed into a metal pole or a steel pole.” (Doc. 89-4 at 31.) He later stated: “The impact was very hard on my back. I could almost feel it reverberating or something.” (Doc. 98-12 at 3.)

Okemo employee Ray Kennedy saw Plaintiff ski toward a snowmaking station, then saw the station’s Gilman TS-2 padding “shudder” and fall from an “upright” position to lay horizontally. (Doc. 89-5 at 3-5.) He did not see the actual collision but testified that the padding was on the uphill side of the snowmaking equipment. At the time, he was looking out of a window in a building approximately 500 feet downhill from the snowmaking equipment.

Plaintiff’s friend, Kyle Cotter, arrived at the accident scene soon after Plaintiff’s collision and observed that Plaintiff “was underneath the pole, underneath the blue foam padding . . . within that little ravine of where that drop-off is” and that he was laying “[o]n his stomach[] . . . [b]asically making a T with his body against the pole.” (Doc. 85-8 at 2-3.) At the time Okemo ski patroller Michael Morabito arrived at the scene, Plaintiff “was up against the post. And his body was a little angulated that way, he was definitely not straight.” (Doc. 85-9 at 3.)

Ski patroller Mary Mancino responded to the scene with Mr. Morabito and observed that Plaintiff “was up against a snow making station . . . against, like, the

padding in front of the snow making station.” (Doc. 104-1 at 3.) In response to questioning, Ms. Mancino testified in her deposition that there was padding on the snowmaking gun when she arrived, and that “[Plaintiff’s] body was – I believe – he was on his belly and his left side was to the snow making station. His head was uphill and the padding was kind of over him as if it had been dislodged a little bit[,]” meaning that “[t]he top [of the padding] was slightly out as if he had hit the bottom of the pad and knocked the top out.” *Id.* at 3-4.

On December 19, 2019, the day of Plaintiff’s collision, Okemo’s assistant on-snow services and trail maintenance manager Kyle Kostura recorded that “all blue padding was covering their respective snowmaking infrastructure as of my departure at 0900.” (Doc. 89-6 at 2.) Mr. Kostura testified in deposition that he did not specifically recall checking the Gilman TS-2 padding on the snowmaking station prior to Plaintiff’s collision but that it “was part of a visual ride through” that he conducted from his snowmobile that morning to confirm that the padding straps were attached to the snowmaking station and that there were no gaps between the padding and the snow. (Doc. 89-7 at 3.)¹ He has never seen a pad that was not touching the snow surface, although he has sometimes needed to dig a buried pad out of the snow.

Plaintiff suffered significant injuries and was rendered a paraplegic. Elizabeth Gilman, President of the corporation that manufactures Gilman TS-2 padding, is unaware of an incident in which a skier was seriously injured when he or she collided with Gilman TS-2 padding. She testified that a Gilman TS-2 pad should prevent a skier from striking the padded pole:

So if the individual were to hit the blue blanket where the cylinders are it is designed to crumple to decelerate him to stop him from actually ending up hitting the metal object behind it. It is impossible to get through the blanket and those two tower cylinders to get to that object.

(Doc. 98 at 20) (quoting Doc. 96-4 at 68).

¹ See Doc. 89-7 at 3 (“Q. Did you check on that specific snowmaking gun and padding that morning, December 19, 2020, before the lifts opened? A. It was part of a visual ride through, yes. Q. Do you have an actual recollection of check in on that? A. Not that specific one, no.”).

Plaintiff claims Defendants inadequately padded the snowmaking station because the Gilman TS-2 padding did not extend to the base of the station, allowing him to collide with the station's bare metal pole. He also asserts that Defendants negligently placed the snowmaking station in the center of a beginner's trail.

II. Dr. Scher's Qualifications.

Dr. Scher is a Principal and Biomechanical Engineer at Guidance Engineering and Applied Research. He has a Ph.D. and Master of Science in Mechanical Engineering from the University of California, Berkeley, and a Bachelor of Science in Mechanical Engineering from the University of Pennsylvania. He specializes in biomechanical engineering and accident reconstruction and has published extensively in these areas, with a particular focus on snow sport safety.

Dr. Scher has chaired or served on boards and committees for organizations including the International Society for Snowsport Safety, the Safety Equipment Institute, and ASTM International. He served as an Adjunct Associate Professor of Clinical Physical Therapy in the Department of Biokinesiology and Physical Therapy at the University of Southern California from 2004 to 2009 and is currently an Affiliate Associate Professor in the Department of Mechanical Engineering at the University of Washington. Since 2017, he has provided expert testimony in depositions, trials, hearings, and arbitration proceedings in state and federal courts.

Dr. Scher provided several opinions in this case, which he described as "presented with a reasonable degree of mechanical engineering, biomechanical engineering, and scientific probability and are provided on a more probable than not basis." (Doc. 85-2 at 39.) Plaintiff asks the court to exclude Dr. Scher's testimony pursuant to Fed. R. Evid. 702 because his opinions are speculative, lack a proper scientific foundation, do not rely on proper scientific methodologies, and exceed his area of expertise. Plaintiff offers an expert rebuttal opinion by J.Q. Campbell, Ph.D. ("Dr. Campbell"), a biomechanical consultant specializing in biomechanics and accident reconstruction, which criticizes each of Dr. Scher's opinions.

III. Conclusions of Law and Analysis.

The admissibility of expert testimony is governed by Fed. R. Evid. 702:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (b) the testimony is based on sufficient facts or data; (c) the testimony is the product of reliable principles and methods; and (d) the expert has reliably applied the principles and methods to the facts of the case.

Rule 702 obligates the court to serve as a gatekeeper for expert testimony, ensuring “that an expert’s testimony both rests on a reliable foundation and is relevant to the task at hand.” *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 597 (1993).

Expert testimony that is admissible under Rule 702 may still be excluded if its “probative value is substantially outweighed by the danger of one or more of the following: unfair prejudice, confusing the issues, misleading the jury, undue delay, wasting time, or needlessly presenting cumulative evidence.” Fed. R. Evid. 403. These dangers are particularly pronounced in the context of expert testimony, given the unique weight that a jury may place on such testimony. *See Daubert*, 509 U.S. at 595 (“Expert evidence can be both powerful and quite misleading because of the difficulty in evaluating it. Because of this risk, the judge in weighing possible prejudice against probative force under Rule 403 of the present rules exercises more control over experts than over lay witnesses.”) (internal quotation marks omitted).

“Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.” *Id.* at 596; *see also United States v. LaVictor*, 848 F.3d 428, 444 (6th Cir. 2017) (holding that “[a]ny emerging prejudice [from an expert witness’s testimony] was addressed during cross-examination”).

A. Whether to Consider Dr. Scher’s Reply Declaration.

In response to Dr. Campbell’s criticisms of his report and Plaintiff’s motion in limine to exclude his opinions, Dr. Scher provided a thirty-page reply declaration with

thirty-five pages of attachments (“Dr. Scher’s Declaration” or the “Declaration”).

Plaintiff does not move to strike Dr. Scher’s Declaration in full but argues the Declaration’s paragraphs 18, 20, 27, 28, 31, 40, 41, 43, 45, and 46 or its attachments are improper and must be excluded because the Declaration was untimely and not properly disclosed.

“[I]f requested and allowed by the [c]ourt, a reply expert report may follow” a rebuttal report. *Sandata Techs., Inc. v. Infocrossing, Inc.*, 2007 WL 4157163, at *1 (S.D.N.Y. Nov. 16, 2007) (citing Fed. R. Civ. P. 26(a)(2)). Expert rebuttal evidence is allowed if it “is intended solely to contradict or rebut evidence on the same subject matter identified by another party [.]” Fed. R. Civ. P. 26(a)(2)(D)(ii); *see also United States v. Casamento*, 887 F.2d 1141, 1172 (2d Cir. 1989) (“The function of rebuttal evidence is to explain or rebut evidence offered by the other party.”); *Suazo v. Ocean Network Express (N. Am.), Inc.*, 2023 WL 2330428, at *11 (S.D.N.Y. Mar. 2, 2023) (“Rebuttal evidence is properly admissible when it will explain, repel, counteract or disprove the evidence of the adverse party.”) (internal quotation marks omitted) (quoting *Scott v. Chipotle Mexican Grill, Inc.*, 315 F.R.D. 33, 44 (S.D.N.Y. 2016)). “The scope of a rebuttal is limited to the ‘same subject matter’ encompassed in the opposing party’s expert report, Fed. R. Civ. P. 26(a)(2)(D)(ii), but district courts have been reluctant to narrowly construe the phrase ‘same subject matter’ beyond its plain language.” *Allen v. Dairy Farmers of Am., Inc.*, 2013 WL 211303, at *5 (D. Vt. Jan. 18, 2013) (internal quotation marks omitted).

A rebuttal expert may use new methodologies “for the purpose of rebutting or critiquing the opinions of [the opposing party’s] expert witness,” *Park W. Radiology v. CareCore Nat’l LLC*, 675 F. Supp. 2d 314, 326 (S.D.N.Y. 2009), but “a rebuttal expert report is not the proper ‘place for presenting new arguments, unless presenting those arguments is substantially justified and causes no prejudice.”” *Dairy Farmers of Am.*, 2013 WL 211303, at *5 (alteration adopted) (quoting *STS Software Sys., Ltd. v. Witness Sys., Inc.*, 2008 WL 660325, at *2 (N.D. Ga. Mar. 6, 2008)).

Regardless of whether a party seeks leave to file a reply expert report, Rule 26(e) requires parties to supplement their Rule 26(a) expert disclosures in a timely manner “if

the party learns that in some material respect the disclosure or response is incomplete or incorrect, and if the additional or corrective information has not otherwise been made known to the other parties during the discovery process or in writing” or “as ordered by the court.” Fed. R. Civ. P. 26(e)(1)(A)-(B). After the parties exchanged initial expert witness disclosures and reports in this case, the court issued a Fourth Amended Stipulated Discovery Schedule/Order requiring the parties to submit expert rebuttal reports on or before May 15, 2022 and to conduct any depositions of rebuttal experts by June 15, 2022. Because the pending motion to exclude Dr. Scher’s opinions relies in part on Dr. Campbell’s rebuttal report and deposition testimony, the court allowed Defendants to submit supplemental briefing in response to Dr. Campbell’s rebuttal opinion.² As Dr. Scher’s Declaration was filed with Defendants’ response, Plaintiff’s argument that it must be excluded on timeliness grounds is unpersuasive.

Dr. Scher’s Declaration must nonetheless comply with the standards governing reply expert reports or supplemental disclosures. Like rebuttal reports, “[r]eply expert reports may be appropriate if the rebuttal reports raise new matters not discussed in the initial reports.” *Ironshore Ins. Ltd. v. W. Asset Mgmt. Co.*, 2013 WL 2051863, at *2 (S.D.N.Y. May 15, 2013). If allowed by the court, a reply report “should be confined to

² In response to Plaintiff’s objection to Defendants’ request for additional time to respond to the motion to exclude Dr. Scher after Dr. Campbell’s deposition, the court stated:

I don’t like the idea of having supplemental briefing when it’s not necessary. If you had moved to exclude the witness[]’s testimony solely as a matter of law with no reference to your expert witness’s opinion, I would agree with you, there’s no reason. But you used your expert’s opinion to impeach, for lack of a better word, their expert and to show why the court should exclude that opinion. So you injected Dr. Campbell into the argument as to why the engineer should be excluded. Having done that, *I will be hearing supplemental briefing*, and I’m going to allow [Defendants] to respond two weeks after the completion of Dr. [Campbell’s] deposition. That will be an all-in response, and you probably will have to order an expedited transcript. But you are, at this point, on notice of what aspects of Dr. [Campbell’s] opinion undercut or allegedly undercut your engineer’s opinion. So that’s how we’re going to do it. And, if [P]laintiff requests an opportunity, well, they will have an opportunity to reply, I will allow that as well.

Transcript from May 23, 2022 Motion Hearing, at 54-55 (emphasis supplied).

new matters adduced by the defense and not to repetition of the plaintiff's theory of the case." *Id.* (internal quotation marks omitted). "It is [also] not an opportunity for the correction of any oversights in the plaintiff's case in chief." *Id.* (internal quotation marks omitted) (quoting *Crowley v. Chait*, 322 F. Supp. 2d 530, 551 (D.N.J. 2004)).

Similarly, an expert may not use Rule 26(e) supplementation as a guise for merely reiterating opinions from his or her initial report or adducing previously available information to strengthen those opinions. "It is only if the expert subsequently learns of information that was previously unknown or unavailable, that renders information previously provided in an initial report inaccurate or misleading because it was incomplete, that the duty to supplement arises." *S.W. v. City of New York*, 2011 WL 3038776, at *2 (E.D.N.Y. July 25, 2011) (internal quotation marks omitted) (quoting *Sandata Techs., Inc.*, 2007 WL 4157163, at *3-4).

Paragraph 18 of Dr. Scher's Declaration summarizes how he conducted his qualitative analysis of Plaintiff's injuries. He opines: "[t]hese types of analyses are biomechanical engineering analyses[.]" (Doc. 102-3 at 9, ¶ 18.) Because it does not respond to Dr. Campbell's report or adduce information correcting or completing his initial opinion on this subject, Paragraph 18 is not a proper subject for reply expert testimony or supplementation.

Dr. Campbell's report criticizes Dr. Scher's deposition testimony regarding how Plaintiff could have come to rest next to the snowmaking station's metal pole after striking the padding. Dr. Campbell opined: "Dr. Scher has not shown any calculations regarding 'the laws of physics' he used to reach this opinion and does not appear to have done any." (Doc. 85-4 at 8) (emphasis omitted). Paragraph 20 of the Declaration responds to Dr. Campbell's criticism by observing that during physical crash testing Dr. Campbell conducted as part of his rebuttal report, the test padding "demonstrate[d] the same . . . response that [Dr. Scher] described in [his] deposition[.]" (Doc. 102-3 at 11, ¶ 20.) Because Paragraph 20 focuses on an issue that was not raised in Dr. Scher's initial report and is "intended solely to contradict or rebut evidence on the same subject matter," Fed. R. Civ. P. 26(a)(2)(D)(ii), it constitutes a permissible reply.

Paragraphs 27, 28, and 31 of the Declaration respond to Dr. Campbell's criticism that Dr. Scher did not validate the computer model he created to assess whether Plaintiff's injuries could have resulted from striking the snowmaking station padding. Dr. Scher's initial report stated that he used the MADYMO human body computer model because of "the well-established and validated database of human and anthropomorphic testing device models" and opined that using MADYMO to "determine fall kinematics and vehicle occupant motions and loads in the body is . . . supported by peer-reviewed, scientific publications that document its validity." (Doc. 85-2 at 29.) The report did not address whether or how Dr. Scher validated the MADYMO human body element of his computer model and did not cite any peer reviewed studies in support. Instead, Dr. Scher's opinion was based on the assumption that because the individual components of his model have been validated, the combination of those components has also been effectively validated.

Paragraph 27 of the Declaration cites examples of how the MADYMO human body model has been validated by others, including by its creators and by a team of French biomechanical engineers in a peer-reviewed article on snowboarding backwards falls (the "Wei article"). Dr. Scher was aware of the MADYMO validation work and Wei article prior to his initial expert report but did not cite them specifically. Validation of the MADYMO model is thus information that should and could have been included in Dr. Scher's initial report. It is neither proper supplementation nor proper rebuttal.

In Paragraph 28 of his Declaration, Dr. Scher cites a 2022 thesis produced by a doctoral biomechanical engineering student that relied upon the Wei article's validation of the MADYMO model for assessing torso injuries (the "Dorsemaine thesis"). In addition to being proffered to rebut Dr. Campbell's criticism, the Dorsemaine thesis did not exist when Dr. Scher produced his initial expert report in December 2021. Paragraph 28 thus constitutes both permissible reply expert testimony and supplemental expert testimony under Rule 26(e).

Dr. Campbell opined that Dr. Scher could have validated his model by "trying to replicate [earlier experimental] tests with the M[ADYMO] human dummy model to

determine if the forces produced by the model corresponded to reality.” (Doc. 85-4 at 20.) In response to Dr. Campbell’s citation to a 2005 paper by Forman et al. supporting this proposition, Dr. Scher states in Paragraph 31 of the Declaration that he performed additional modeling work to replicate Forman et al.’s physical cadaver testing using his computer model, then compared the results to validate his model. This testing, however, ventures beyond “addressing the deficiencies” of Dr. Campbell’s testimony regarding the MADYMO validation generally or “explaining why [Dr. Campbell’s validation testimony] was defective.” *Lidle v. Cirrus Design Corp.*, 2009 WL 4907201, at *5 (S.D.N.Y. Dec. 18, 2009). The Forman et al. research was available well before Dr. Scher’s initial expert report. Because “[t]here is no reason that [Dr. Scher] could not have conducted those tests before his initial report was drafted,” Paragraph 31 does not qualify as a proper reply or supplemental expert disclosure. *Id.* (observing that “plaintiffs’ gamesmanship in this regard is precisely what the Rules were intended to prevent”).

Similarly, Dr. Campbell’s report critiqued Dr. Scher’s modeling of the snowmaking station padding and stated that Dr. Campbell conducted experimental crash tests to validate Dr. Scher’s padding model. Paragraph 40 of the Declaration states that in response to Dr. Campbell’s rebuttal opinion, Dr. Scher verified the validity of his padding model by using the computer model to replicate a 2009 study of the force generated by a ballistic pendulum contacting a Gilman TS-2 snowmaking station pad. Dr. Scher’s response in Paragraph 40 does not address the deficiencies of Dr. Campbell’s analysis but attempts to introduce new evidence of new testing he could have conducted prior to his initial expert report. Paragraph 40 therefore also does not constitute an appropriate reply report or supplemental expert disclosure.

Paragraphs 41, 43, 45, and 46 of the Declaration address Dr. Campbell’s criticisms of the data and methodology Dr. Scher used to calculate the “Factor of Risk,” a ratio using the outputs of the computer model to assess the likelihood of injuries similar to Plaintiff’s. These paragraphs of the Declaration respond directly to Dr. Campbell’s rebuttal report and seek to contradict or rebut his opinions by pointing out deficiencies in his data and reasoning. This type of point-by-point rebuttal is the proper function of a

reply report: “to contradict, impeach or defuse the impact of the evidence offered by an adverse party.” *Peals v. Terre Haute Police Dep’t*, 535 F.3d 621, 630 (7th Cir. 2008) (citation omitted). “To the extent that [Dr. Scher] disclose[s] new opinions [or data] that were not included in [his] original reports, [these paragraphs] are clearly responsive to [Dr. Campbell’s] report[] and do not cause prejudice or surprise to [Defendants].” *S.W.*, 2011 WL 3038776, at *4; *see also Suazo*, 2023 WL 2330428, at *12 (admitting rebuttal expert testimony that fell “[s]quarely within the scope” of the initial expert report). “[T]he rules do not require an expert to anticipate every argument made by an opposing expert or risk preclusion.” *S.W.*, 2011 WL 3038776, at *4. Paragraphs 41, 43, 45, and 46 are thus appropriate reply expert testimony.

In addition to the Wei article, the Declaration’s attachments include numerous PDF versions of websites about biomechanical engineering from an array of universities. These attachments are not responsive to Dr. Campbell’s rebuttal report, nor do they supplement Dr. Scher’s initial report with previously unknown or unavailable information. They are accordingly impermissible as a reply opinion or a supplemental disclosure.

Even when an expert reply or rebuttal report is improper, because preclusion of an expert report may “be a harsh sanction[,]” *Cedar Petrochemicals, Inc. v. Dongbu Hannong Chem. Co.*, 769 F. Supp. 2d 269, 278 (S.D.N.Y. 2011), courts must consider the following factors when determining whether to strike an improper expert report: “(1) the party’s explanation for the failure to comply with the discovery order; (2) the importance of the testimony of the precluded witness; (3) the prejudice suffered by the opposing party as a result of having to prepare to meet the new testimony; and (4) the possibility of a continuance.” *Softel, Inc. v. Dragon Med. & Sci. Commc’ns, Inc.*, 118 F.3d 955, 961 (2d Cir. 1997) (citing *Outley v. City of New York*, 837 F.2d 587, 590-91 (2d Cir. 1988)). The court allowed Defendants to submit supplemental briefing, and Dr. Scher’s opinions are key to their argument that Plaintiff cannot prove the causation element of his negligence claim. Nonetheless, allowing Dr. Scher to bolster his opinions with information and new testing which were previously available to him causes both

prejudice and surprise to Plaintiff. Dr. Scher has been deposed. Plaintiff should not be required to re-depose him to address an impermissible reply or supplementation. As the court has denied Defendants' motion for summary judgment, this case is ready to be set for trial. A continuance at this late stage is not warranted. *See* Fed. R. Civ. P. 1.

"Alternative sanctions would not effectuate the intent of the discovery rules, cure the prejudice to [Plaintiff], and allow this litigation to continue apace." *In re Terrorist Attacks on Sept. 11, 2001*, 2023 WL 2366854, at *7 (S.D.N.Y. Mar. 6, 2023). Although the court does not sanction Defendants, striking portions of an extensive Declaration must still be consistent with the Federal Rules. For this reason, the court has nevertheless considered Dr. Scher's improper rebuttal and supplementation and concludes that it does not affect the court's rulings herein.

For the foregoing reasons, in deciding the pending motion to exclude the court will not consider Paragraphs 18, 27, 31, or 40 of Dr. Scher's Declaration, or the Declaration's attachments consisting of websites about biomechanical engineering generally or university biomechanical engineering departments.

B. Whether Dr. Scher's Photogrammetric Analysis and Related Opinion Must Be Excluded.

Dr. Scher used photogrammetry to estimate the distance between the snow surface and the bottom of the padding attached to the snowmaking station with which Plaintiff collided. Comparing the typical chest and shoulder dimensions of a man of Plaintiff's height and weight with the results of his photogrammetric analysis, Dr. Scher opined:

If the subject Gilman TS-2 padding system was strapped to the subject HKD snowmaking gun base such that it was levitating off the snow (as suggested by [Plaintiff's expert] Mr. [Dick] Penniman), the space under the padding system (to the snow) would have been limited by the geometry of HKD snowmaking gun equipment. This space would not have permitted an individual of Mr. Grajeda's size to move under the padding system and contact significantly the metal base.

(Doc. 85-2 at 39.)

Relying on known measurements of objects in a photograph taken on the day of Plaintiff's collision, including a sign, the snowmaking station, and the padding, Dr. Scher

determined that the padding's position would have been limited by the snowmaking gun's jackscrew, bracket, and hose attachment. He concluded that there were approximately two to three inches between the padding and the snow surface; that the bottom and top of the exposed jackscrew were approximately fifty-nine and seventy-six inches above the snow surface, respectively; and that the hose attachment was sixty-six inches above the snow surface. Based on these measurements, the site inspections conducted at his direction, witness testimony that the padding generally faces uphill, and his experience examining ski area padding, Dr. Scher opined that the padding system could only have moved upward five inches before contacting the jackscrew's top attachment. He did not observe "physical evidence of contact" with the jackscrew on the padding, indicating that the padding was not forced up before or during Plaintiff's accident. (Doc. 85-2 at 19-20.) He confirmed the results of his photogrammetric analysis by creating a virtual model of the padding and snowmaking equipment in a computer graphics program called 3D Studio Max using data from a "laser scan" of the collision site, photographs from the investigation, and the known dimensions of the padding and snowmaking equipment.

Plaintiff contends Dr. Scher is not an expert in photogrammetry and his photogrammetric analysis is unreliable. He further contends that Dr. Scher did not take the photograph on which he relies and did not personally verify its accuracy.

"[P]hotogrammetry [is] the science of measurement from photographs." *Gecker as Tr. for Collins v. Menard, Inc.*, 2019 WL 3778071, at *4 (N.D. Ill. Aug. 12, 2019) (internal quotation marks omitted). As an engineer, Dr. Scher is trained in measurement and mathematical analysis. He has used photogrammetry in his work for the past nineteen years. His "knowledge, skill, experience, training, or education" qualify him to provide expert testimony about photogrammetry. Fed. R. Evid. 702.

Courts have recognized photogrammetry and the associated use of laser scanning are reliable methodologies accepted within the fields of science and engineering. *Gecker as Tr. for Collins*, 2019 WL 3778071, at *4 (collecting cases and observing that "[a]s technology has become more advanced, so too have photogrammetric techniques and

applications; however, photogrammetry itself has a long, recognized history of reliability in the scientific and judicial community”); *see also id.* at *5 (“When Dr. Fisher generated a laser scan point cloud using the Faro Focus3D X330 scanner, he applied standard, peer-reviewed techniques from the field of photogrammetry in forming his conclusions.”).

While Plaintiff does not contend that photogrammetry is unreliable as a methodology, he asserts that Dr. Scher failed to reliably apply photogrammetric methods to the available evidence because he analyzed a single photograph taken by an unidentified person several hours after Plaintiff’s accident in which the padding has been replaced on the snowmaking gun base by an unknown person. He also inspected the scene virtually rather than in person and relied on measurements taken by others. His subsequent laser scan was taken more than a year after the accident. Plaintiff’s rebuttal expert Dr. Campbell opined that Dr. Scher’s analysis is inaccurate because the objects in the photograph were not situated in a single plane perpendicular to the camera and the photograph shows visible variation in the surface of the snow around the snowmaking station base. He contested the accuracy of Dr. Scher’s assumptions that the padding faced uphill and that its position and movement were limited by the snowmaking station’s structure.

Although an expert’s testimony may not be “speculative or conjectural,” an expert may base his testimony upon reasonable assumptions of fact. *Boucher v. U.S. Suzuki Motor Corp.*, 73 F.3d 18, 21 (2d Cir. 1996) (“A district court has discretion under Federal Rule of Evidence 703 “to determine whether the expert acted reasonably in making assumptions of fact upon which he would base his testimony”) (internal quotation marks omitted). “Unless the information or assumptions that [the] plaintiff’s expert relied on were ‘so unrealistic and contradictory as to suggest bad faith,’ inaccuracies in the underlying assumptions or facts do not generally render an expert’s testimony inadmissible.” *Scott v. Chipotle Mexican Grill, Inc.*, 315 F.R.D. 33, 52 (S.D.N.Y. 2016). “Other contentions that the assumptions are unfounded go to the weight, not the admissibility, of the testimony.” *Zerega Ave. Realty Corp. v. Hornbeck Offshore Transp.*,

LLC, 571 F.3d 206, 214 (2d Cir. 2009) (alteration adoption and internal quotation marks omitted).

Dr. Scher need not take a photograph himself in order to rely on it in forming his opinions. *See Daubert*, 509 U.S. at 592 (“Unlike an ordinary witness, see Rule 701, an expert is permitted wide latitude to offer opinions, including those that are not based on firsthand knowledge or observation.”); *United States v. Clayton*, 643 F.2d 1071, 1074 (5th Cir. 1981) (“A witness qualifying a photograph need not be the photographer or see the picture taken; it is sufficient if he recognizes and identifies the object depicted and testifies that the photograph fairly and correctly represents it.”); *see also United States v. Ruggiero*, 928 F.2d 1289, 1303 (2d Cir. 1991) (“Rule 901(a) requires the proponent of any evidence to submit ‘evidence sufficient to support a finding that the matter in question is what its proponent claims.’ This requirement is satisfied if sufficient proof has been introduced so that a reasonable juror could find in favor of authenticity or identification.”) (internal quotation marks omitted). He also need not personally inspect the scene depicted in the photograph. *See Jackson v. E-Z-Go Div. of Textron, Inc.*, 326 F. Supp. 3d 375, 436 (W.D. Ky. 2018) (“Photogrammetry is defined by taking measurements based on objects in *photographs* of an accident scene and does not require examination of the scene itself.”) (emphasis in original). Although it is unclear whether certain objects and the snow contours in the photograph reflected the conditions at the time of the Plaintiff’s collision and remained undisturbed by a presumably chaotic accident scene, these disagreements generally pertain to weight as opposed to admissibility.

Likewise, it matters not whether Dr. Scher took certain measurements himself provided those measurements are reliable. The photograph Dr. Scher analyzed contains multiple objects whose dimensions were measured by individuals following his directions. It also depicts the padding which Dr. Scher personally examined and measured and upon which his opinions regarding the orientation of the padding are based. Dr. Scher claimed these opinions are corroborated by Okemo employee Ray Kennedy’s deposition testimony that at the time of the collision the padding was upright and facing

uphill.

Dr. Scher's assumptions are reasonable and non-speculative in light of the information available to him. *See Gecker as Tr. for Collins*, 2019 WL 3778081, at *6 ("Under *Daubert*, the accuracy of Dr. Fisher's underlying data goes to weight, not admissibility, of his [photogrammetry] testimony."). They do not contain obvious inaccuracies suggestive of bad faith. To the extent Plaintiff wishes to contest the accuracy of Dr. Scher's measurements or assumptions, he may do so on cross-examination. *See Amorgianos v. Nat'l R.R. Passenger Corp.*, 303 F.3d 256, 267 (2d Cir. 2002) (recognizing that "our adversary system provides the necessary tools for challenging reliable, albeit debatable, expert testimony").

Finally, although the court has not yet ruled whether the photograph fairly and accurately represents what is depicted therein at the relevant time of Plaintiff's collision, *see Zerega*, 571 F.3d at 214 (upholding objection to admission of photograph that district court sustained for lack of a proper foundation), evidence generally need not be admissible to provide a basis for an expert witness opinion. *See United States v. Mejia*, 545 F.3d 179, 197 (2d Cir. 2008) ("Under Rule 703, experts can testify to opinions based on inadmissible evidence, including hearsay, if 'experts in the field reasonably rely on such evidence in forming their opinions.'") (quoting *United States v. Locascio*, 6 F.3d 924, 938 (2d Cir. 1993)). In this case, however, whether the photograph is a true and accurate representation of the objects depicted therein is likely to be essential to the admissibility of Dr. Scher's opinions. Because Defendant may be able to lay a proper foundation for the photograph on which Dr. Scher's photogrammetry opinions are based, Plaintiff's motion to exclude those opinions is DENIED WITHOUT PREJUDICE.

C. Whether Dr. Scher's Qualitative Analysis of Possible Injury Mechanisms Must Be Excluded.

Dr. Scher reviewed Plaintiff's medical records and other materials to conduct a qualitative analysis of the mechanisms of Plaintiff's injuries, including whether Plaintiff's injuries could have been produced by impacting the padding on the snowmaking station base, and whether Plaintiff's injuries were more consistent with

striking the padding or the metal base. In light of the injuries described in Plaintiff's medical records,³ he concluded that Plaintiff's "thoracic spine injuries were produced biomechanically by a large extension moment, along with axial loading of the spine and a lateral bending moment." (Doc. 85-2 at 39.) Dr. Scher opined that this large "extension moment" occurred when Plaintiff struck the left side of his mid-lower back on the padding, causing his torso to decelerate while his pelvis and lower extremities continued at their pre-impact velocities. According to Dr. Scher, the loads produced by this impact and the energy and momentum of the "non-contact areas" overwhelmed the load bearing capacity of Plaintiff's thoracic spine. *Id.* at 26. "Portions of this additional momentum and energy were attenuated by the creation of additional injuries (such as ligament tears and transverse process fractures)." *Id.*

Considering Plaintiff's "constellation of spine fractures," "large region of tissue swelling," and "posterior, medial rib head fractures," as well as his lack of injuries consistent with striking a "fixed rigid object" such as contusions, abrasions, lacerations, localized ecchymosis, or anterolateral or posterior-lateral rib fractures, *id.* at 27-28, Dr. Scher opined that Plaintiff's injuries were more consistent with striking the Gilman TS-2 padding than a metal pole. If Plaintiff's left mid-back had contacted the metal base of the snowmaking equipment, Dr. Scher opined Plaintiff would likely have "sustained additional rib fractures, spinous process fractures, localized ecchymosis, contusions, abrasions, and/or lacerations on his body where he contacted the pole." *Id.* at 28. Absent

³ Dr. Scher described Plaintiff's injuries as follows:

[Plaintiff's] post-accident medical records reported an unstable T9 fracture involving middle and posterior columns with evidence of ligamentous injury involving the T8-T9 anterior and longitudinal ligament, posterior longitudinal ligament, interspinous ligament, and right capsular ligament. In addition, the medical records document an epidural hemorrhage at T8 and T9, epidural air from T6 through L1, paraspinous soft tissue swelling and gas in paraspinous soft tissues from T5 through T12, a pleural hemorrhage (more on the right side), an aortic injury at T9-T10, posterior medial rib fractures at T8 through T10, and fractures of the left L1 and L2 transverse processes.

(Doc. 85-2 at 26.)

physical evidence of these types of injuries, Dr. Scher opined Plaintiff's injuries were most likely produced by striking the Gilman TS-2 padding.

Plaintiff contends that Dr. Scher is not qualified to testify regarding the specific causation of Plaintiff's injuries because he is not a medical doctor and lacks sufficient medical training. Defendants counter that biomechanical engineers are "qualified to testify as to the force on [a] [p]laintiff's body during the accident, the type of injury it could cause, and whether [a] [p]laintiff's injuries were consistent with that analysis." *Gecker as Tr. for Collins*, 2019 WL 3778071, at *8. Dr. Scher opined that because biomechanical engineering focuses on determining the forces and motions creating damage to the body, it is distinct from medicine, which instead focuses on diagnosing and treating the damage.⁴

Courts in the Second Circuit typically allow biomechanical engineers to testify only to general causation, "i.e., whether the force sustained by a 'plaintiff in the subject accident could potentially cause certain injuries.'" *Thomas v. YRC Inc.*, 2018 WL 919998, at *5 (S.D.N.Y. Feb. 14, 2018) (emphasis omitted) (quoting *Manlapig v. Jupiter*, 2016 WL 916425, at *3 (S.D.N.Y. Mar. 10, 2016)). A biomechanical engineer without a medical degree or training is therefore generally not allowed to "testify regarding whether a specific accident caused or contributed to a plaintiff's injuries." *Gade v. State Farm Mut. Auto. Ins. Co.*, 2015 WL 7306433, at *15 (D. Vt. Nov. 19, 2015) (footnote omitted);

⁴ The Federal Judicial Center's REFERENCE MANUAL ON SCIENTIFIC EVIDENCE (3d ed. 2011), which Dr. Campbell cited in his rebuttal report, states:

The traditional role of the physician is the diagnosis (identification) of injuries and their treatment, not necessarily a detailed assessment of the physical forces and motions that created injuries during a specific event. The field of biomechanics (alternatively called biomechanical engineering) involves the application of mechanical principles to biological systems, and is well suited to answering questions pertaining to injury mechanics. Biomechanical engineers are trained in principles of mechanics (the branch of physics concerned with how physical bodies respond to forces and motion), and also have varying degrees of training or experience in the biological sciences relevant to their particular interest or expertise.

(Doc. 102-4 at 4.)

see also *Bennett v. Target Corp.*, 2019 WL 7556361, at *7 (E.D.N.Y. Jan. 2, 2019) (agreeing with courts in the Southern District of New York that without medical training, “biomechanical engineers are not qualified to testify as to whether an accident caused or contributed to any of plaintiff’s injuries, as this would amount to a medical opinion”) (alteration adopted and internal quotation marks omitted).

Although Dr. Scher received training in human biology as part of his education, he does not have a medical degree or formal medical training. He is therefore unqualified to “venture into the realm of medical diagnosis by reviewing [Plaintiff’s] primary medical records and opining as to the extent of his injuries.” *Rodriguez v. Athenium House Corp.*, 2013 WL 796321, at *5 (S.D.N.Y. Mar. 5, 2013).⁵ His opinions regarding the mechanism of Plaintiff’s injury are not framed as general causation opinions “about the nature and amount of force generated by the accident in question and the observed effect of that force on a human body in comparable accidents.” *Morgan v. Girgis*, 2008 WL 211250, at *6 (S.D.N.Y. May 16, 2008). Instead, they purport to opine as to the specific cause of Plaintiff’s injuries.

Because Dr. Scher is not qualified as an expert witness in the medical field, Plaintiff’s motion to exclude Dr. Scher’s specific causation opinion based on his qualitative analysis is GRANTED. Dr. Scher may provide only an opinion regarding general causation which is a factual predicate for his specific causation opinion.

⁵ Several courts have excluded Dr. Scher’s specific causation opinions. See, e.g., *Cooper v. Thompson*, 353 P.3d 782, 791 (Alaska 2015) (affirming trial court’s limitations on Dr. Scher’s testimony based on its “conclu[sion] that any testimony about the specific causes of [the plaintiff’s] injuries would exceed Dr. Scher’s biomechanics expertise and amount to a medical diagnosis he was not qualified to make”); *Forhan v. Altena*, 2012 WL 6727465 (Wash. Super. July 5, 2012) (“Scher is simply not qualified to give such opinions about the causal connection between the collision and Plaintiff’s injuries.”); *Wallace v. Pineda*, No. A-14-705744-C (Nev. Dist. Ct. Aug. 8, 2016) (excluding Dr. Scher’s opinions that “biomechanically, the force and other facts [Dr. Scher] identified from the collision are not consistent with causing certain injuries to Plaintiff” and observing “[t]o the degree [Dr. Scher] has published anything on biomechanics, he has not shown any of his work was applicable to Plaintiff[’s] . . . specific injuries”).

D. Whether Dr. Scher's Opinion Based on His Computer Modeling Must Be Excluded.

Dr. Scher created a computer model to determine the possible force on Plaintiff's spine from impacting a snowmaking station with Gilman TS-2 padding that was fully or partially fastened to the snowmaking station's base. Based on simulations he ran with his model, he opined that Plaintiff's injuries were caused by striking the snowmaking station padding at a high rate of speed. In turn, he opined that Plaintiff would have sustained the same injuries whether the padding was properly installed or not. Dr. Scher recorded the simulation input parameters and results in a spreadsheet but did not otherwise save the raw output data from the over seventy computer simulations he ran.

According to Dr. Scher, his computer model supported the conclusion that Plaintiff must have slid into the padding at sixteen or more miles per hour to produce his thoracic spine injuries, leading Dr. Scher to conclude that "it is highly likely that [Plaintiff] was skiing faster than a typical beginner,⁶ and at or above the average speeds of non-beginners on these types of trails, prior to contacting the Gilman TS-2 padding system (that is, when he was skiing just before his accident)." *Id.* at 31 (footnote supplied).

Dr. Scher's computer model combined two software programs: MADYMO and LS-DYNA. Dr. Scher described MADYMO as a "well-established and validated database of human and anthropomorphic testing device models" that is "regularly" used by biomechanical engineers "to model accidents and determine the motions of individuals[.]" (Doc. 85-2 at 29.) Using MADYMO, Dr. Scher created a "surrogate" for Plaintiff by scaling the MADYMO human body model to represent a 5'11" tall, 180-pound man wearing a ski helmet and ski boots.⁷ He used MADYMO to model the

⁶ Dr. Scher based his opinion regarding typical speed for beginner skiers on his research on skier speeds, which found that "the average speed of beginner and non-beginner skiers on slopes similar to Lower Mountain Road is 10.5 miles per hour and 18.6 miles per hour[.]" respectively. (Doc. 85-2 at 23.) His report does not, however, cite this research or any other publications supporting this data.

⁷ It is undisputed Plaintiff was not wearing skis when he collided with the snowmaking station.

interactions between surfaces and the computer surrogate and the loads on the surrogate. He used LS-DYNA to model the “finite[]lements,” such as the snowmaking equipment and Gilman TS-2 padding system, based on his measurements, unidentified scientific literature, and material testing of a piece of Gilman TS-2 padding which he acquired from a mountain in New Jersey.

To “test a range of potential impact scenarios[,]” Dr. Scher used his model with various initial conditions, including the surrogate’s location relative to the snowmaking gun, its body position, and its velocity. *Id.* He conducted simulations in which the padding was “fixed permanently” to the snowmaking gun’s base, unattached and able to move freely, or removed entirely. He then compared the model’s outputs for the human body’s kinematics, thoracic spine compression force, and thoracic spine moment with the forces associated with injury creation. He named this ratio the “Factor of Risk.” *Id.* When the Factor of Risk was above one, a thoracic spine injury was more likely than not, with the likelihood increasing as the Factor of Risk increased. Dr. Scher opined that regardless of whether the padding was fixed or could move freely, when the model’s surrogate impacted his left mid-back on the padding, “extension moments and axial compression loads in the mid-thoracic spine were often large and the associated Factor of Risk ratio exceed[ed] . . . [one] when using the scaled values for thoracic spine injury.” *Id.* at 30.

As of the issuance of his initial expert witness report, Dr. Scher had not independently validated his novel application of the MADYMO and LS-DYNA programs and cited no evidence that anyone else had done so.

1. Whether Dr. Scher’s Computer Modeling Opinion Is Admissible Under Fed. R. Evid. 702.

Plaintiff asks the court to exclude Dr. Scher’s opinions based on his computer modeling because they were created for the purposes of this litigation, because Dr. Scher is not qualified to model thoracic spine injuries, and because his model is unreliable, irrelevant, and untested. Plaintiff observes that Dr. Scher’s novel computer modeling has never been peer-reviewed or validated by either Dr. Scher or anyone else.

Dr. Scher uses computer modeling in his research, and the scientific literature

proffered by the parties demonstrates that biomechanical engineers commonly use computer modeling to simulate impacts on the human body. As a threshold matter, Dr. Scher's "knowledge, skill, experience, training, [and] education" in the field of biomechanical engineering qualify him to testify as an expert regarding computer modeling of thoracic spine injuries. Fed. R. Evid. 702.

"[W]hether a witness's area of expertise [is] technical, scientific, or more generally 'experience-based,' Rule 702 requires the district court to fulfill the 'gatekeeping' function of 'mak[ing] certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.'" *Nimely v. City of New York*, 414 F.3d 381, 396 (2d Cir. 2005) (citations and footnote omitted).

In deciding whether a step in an expert's analysis is unreliable, the district court should undertake a rigorous examination of the facts on which the expert relies, the method by which the expert draws an opinion from those facts, and how the expert applies the facts and methods to the case at hand.

Amorgianos, 303 F.3d at 267.

a. The Computer Model's Basis in Peer-Reviewed Research, Error Rate, and Raw Output Data.

"In determining whether a computer simulation is reliable, the court may consider whether the program has been or can be tested, has been subjected to peer review and publication, has a known or potential rate of error and has gained general acceptance in the relevant scientific community." *Valente v. Textron, Inc.*, 931 F. Supp. 2d 409, 420 (E.D.N.Y. 2013), *aff'd*, 559 F. App'x 11 (2d Cir. 2014) (citing *Daubert*, 509 U.S. at 593-94). Although Dr. Scher testified that he has published peer-reviewed research using the same combination of LS-DYNA and MADYMO, he did not identify this research. Moreover, while his research has focused on snow sport safety generally, Dr. Scher has not studied impacts to the thoracic spine as part of that work. Rather, he "developed [his] opinions expressly for purposes of testifying." *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 43 F.3d 1311, 1317 (9th Cir. 1995). The fact that Dr. Scher's opinions were derived

solely for purposes of litigation undercuts their reliability. *See id.* (expressing a preference for opinions derived not solely for litigation purposes because “an expert [who] testifies based on research he has conducted independent of the litigation provides important, objective proof that the research comports with the dictates of good science”).

There is no known error rate for Dr. Scher’s model. *See Daubert*, 509 U.S. at 594 (“[I]n the case of a particular scientific technique, the court ordinarily should consider the known or potential rate of error[.]”); *Valente*, 931 F. Supp. 2d at 421 (“The Court also finds that [the expert’s] simulation model is not reliable because its error rate is unknown and cannot be determined.”). Dr. Scher’s work in this case has not been peer-reviewed or published, *see Daubert*, 509 U.S. at 593 (observing that “[a]nother pertinent consideration is whether the theory or technique has been subjected to peer review and publication” though “[p]ublication . . . is not a *sine qua non* of admissibility”), nor has it been tested. *See id.* (“Ordinarily, a key question to be answered in determining whether a theory or technique is scientific knowledge that will assist the trier of fact will be whether it can be (and has been) tested.”).

Plaintiff asserts that Dr. Campbell was unable to replicate Dr. Scher’s computer model simulation results using the data and software he provided, because although Dr. Scher provided the model files and a summary of the results he obtained for each set of input parameters he used, he did not retain or provide the raw output data produced when he ran the model. He averred that in his experience as a journal editor and reviewer, article manuscripts are commonly accepted for publication when accompanied by data in the format he employed. This may be true, however, “[t]he Advisory Committee’s notes to the 1993 amendment of Rule 26 of the Federal Rules of Civil Procedure specifically state that the expert witness disclosure include the data and other information considered by the expert.” *Wile v. James River Ins. Co.*, 2020 WL 5995183, at *4 (W.D.N.Y. Oct. 9, 2020). Without disclosure of Dr. Scher’s raw data, “there is no way to check the quality and accuracy of [his] work.” *Bain v. Wrend*, 2017 WL 11505976, at *2 (D. Vt. Sept. 6, 2017). The inability to test Dr. Scher’s model weighs against its admissibility under Rule 702.

b. The Computer Model's Factual Inputs.

Although experts may make reasonable assumptions of fact, they may not offer testimony that is “speculative or conjectural[.]” *Major League Baseball Props., Inc. v. Salvino, Inc.*, 542 F.3d 290, 311 (2d Cir. 2008) (“At trial, proffered expert testimony should be excluded if it is speculative or conjectural . . . ; the [a]dmission of expert testimony based on speculative assumptions is an abuse of discretion[.]”) (first alteration in original) (internal quotation marks and citations omitted). If expert testimony does not “fit” the facts of the case so that it is helpful to the jury in understanding the evidence or resolving a factual dispute, it does not satisfy the requirements of Rule 702. *Daubert*, 509 U.S. at 591 (citing *United States v. Downing*, 753 F.2d 1224, 1242 (3d Cir. 1985)); see also *Downing*, 753 F.2d at 1242 (observing that an “aspect of relevancy” is “whether expert testimony proffered in the case is sufficiently tied to the facts of the case that it will aid the jury in resolving a factual dispute”).

Dr. Scher ran more than seventy simulations of Plaintiff's collision using different combinations of variables such as velocity, slope angle, pad stiffness, and with the padding affixed permanently to the snowmaking equipment and not affixed at all. Although he testified that his intent was not to recreate the actual collision,⁸ he relied on

⁸ When Dr. Scher was asked, “[I]n doing this modeling were you attempting to re-create the incident?” he responded, “No, I was not.” (Doc. 119 at 41.) Dr. Scher's concession that he did not attempt to recreate the actual collision reflects his opinion that it does not matter how Plaintiff came to collide with the snowmaking system as he only studied what transpired at the moment of impact. Dr. Scher explained: “[Y]ou're right, in the sliding portion, all those things that you mention absolutely matter: the snow, topography, the type of snow, all of those things. I agree 100 percent. Those things only don't matter -- or they don't matter only when you're considering that 100 milliseconds of padding contact.” (Doc. 124 at 84-85.) He explained why he considered only the padding contact as follows:

Q. How long is the model analyzing the impact here?

A. Approximately 120 milliseconds.

Q. And why is it running for 120 milliseconds?

A. Because that's when the peak loads occur. So after 120 milliseconds, the injury would already have happened, and so I'm not interested after that.

Q. And how do you know that peak loads occur at that point?

the simulation results to opine that it was “highly likely” that Plaintiff was skiing faster than sixteen miles per hour when he fell and that Plaintiff’s injuries resulted from sliding into the padding, not the snowmaking gun’s metal base, at a high rate of speed, purportedly to demonstrate that Plaintiff was at least contributorily negligent for his own injuries. (Doc. 85-2 at 31.) The range of values Dr. Scher used in his model do not reflect the known facts of the case and thus Dr. Scher has failed to “show that he has sufficient data to use the methodology employed.” *Rogers by Rogers v. K2 Sports, LLC*, 348 F. Supp. 3d 892, 901 (W.D. Wis. 2018). Similar computer modeling work by Dr. Scher has been excluded by at least one other federal court which found that “[his] simulation, and the opinions based on it, are inadmissible because they are based on guesswork rather than the facts of [the plaintiff’s] accident.” *Id.* As one court explained:

A district court must determine whether a methodology, even one based on established scientific foundations, is reliable for the factual issues raised in a particular case. . . . Even a generally accepted computer simulation program, like PC–Crash, which is based on the laws of physics and accepted principles of accident reconstruction, is not a reliable methodology in all factual circumstances[.]

Valente, 931 F. Supp. 2d at 421.

Because Dr. Scher’s computer modeling does not reflect the known facts of the case, whether it can be reliably used to analyze those factual circumstances remains unknown. *See Dreyer v. Ryder Auto. Carrier Group, Inc.*, 367 F. Supp. 2d 413, 434 (W.D.N.Y. 2005) (“The reliability of the expert’s methodology in reaching his conclusions must . . . be evaluated against the specific facts at issue, not generalized theories.”) (citing *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 154 (1999)). This, too, weighs against its admissibility.

A. Because afterwards you see the loads decreasing as you continue the simulation.

Q. And what’s the significance of the peak loads?

A. The peak loads would be the highest likelihood of injury.

(Doc. 119 at 48.)

c. Validation of the Computer Model's Application of MADYMO and LS-DYNA.

“Regardless of the use, confidence in computational simulations is only possible if the investigator has verified the mathematical foundation of the model and validated the results against sound experimental data.” Doc. 85-4 at 19 (quoting Heath B. Henninger et al., *Validation of Computer Models in Biomechanics*, 224(7) PROCS. INST. MECH. ENG’RS, PART H: J. ENG’G MED. 801 (2010)) (internal quotation marks omitted); *Valente*, 931 F. Supp. 2d at 421 (“Without validation, the Court cannot determine whether [the expert]’s simulation model, reliably simulates an accident involving a vehicle rollover.”). “[V]alidation is defined as the process of determining the degree to which a model is an accurate representation of the real world from the perspective of the intended uses of the model[.]” Doc. 85-4 at 19 (internal quotation marks omitted). “[I]n order to validate a simulation through real-world testing, an individual must put certain inputs into both the simulation and the real-world system and compare the results to see if they are similar enough within some desired degree of accuracy.” *Valente*, 931 F. Supp. 2d at 423–24.

Dr. Scher contends that his modeling work is consistent with that conducted by a team of biomechanical engineers in France who have used computer modeling to study spinal flexion-extension injuries in snowboarding accidents. Like Dr. Scher, those researchers combined “finite element” and human body model software packages. The researchers then “validated” their models by using them to reproduce experimental crash tests and compared the results from the computer model simulations and crash tests. They also compared the response of the MADYMO human body model to work with cadavers published by other researchers.⁹

⁹ The researchers summarized their process in the abstract of their 2018 paper *Spinal Injury Analysis for Typical Snowboarding Backward Falls*: “A human facet-multibody model, which was calibrated against spinal flexion-extension responses and validated against vehicle-pedestrian impact and snowboarding backward fall, was used to reproduce typical snowboarding backward falls considering various initial conditions The SPI risks were quantified by normalizing the numerical spinal flexion-extension ROMs against the corresponding ROM thresholds from literature.” (Doc. 102-3 at 48.)

In response to criticism that he could and should have performed a similar validation of his novel application of the LS-DYNA and MADYMO programs, Dr. Scher testified:

What you're asking would be for me to take a cadaver and then take that and run it into the subject padding, which is more equivalent to the human body model. I think that would be difficult and I'm not sure ethically sound with the University of Washington here to do that for a forensic case.

(Doc. 119 at 110.)

Dr. Scher also conceded that he did not validate his model using “real[-]world crash test validation” with crash dummies (Doc. 85 at 15), but responded in his Declaration to Dr. Campbell’s criticism by claiming he later “validated” the MADYMO human body model for blunt impacts to the thoracic spine region by using MADYMO and LS-DYNA to “model[] the impacts described by Forman et al.[.]” who conducted an experiment in which they “contacted the back of seated cadavers with a rigid impactor and reported thoracic spine extension angles[.]” (Doc. 102-3 at 18.) He averred that because “[t]he human body model’s thoracic spine response in the simulated impacts matched well the thoracic spine extension results reported by Forman et al.[.] . . . the MADYMO human body model passes validation for impacts to the thoracic spine region.” *Id.* This validation process was similar to that used by the French research team and cited by Plaintiff, as well to that employed in at least one research study conducted by Dr. Campbell. Dr. Scher averred that it is common practice for biomechanical engineers to rely on this type of validation.

Dr. Scher’s validation based on the Forman et al. study does not constitute proper reply expert testimony or supplemental expert disclosure. He did not proffer any other admissible evidence showing that he personally validated the MADYMO human body model for thoracic spine impacts. After his report and rebuttal reports, he claimed to have sent an email dated January 12, 2023 to Dr. Pierre-Jean Arnoux which resulted in a response that was favorable. Defendants’ counsel did not produce this email until the eve of the second part of the court’s *Daubert* hearing and the court ruled that this late disclosure was improper supplementation of an expert witness’s opinion.

Dr. Scher claimed he did not need to validate his model personally, because he merely combined two validated software programs¹⁰ and because “[e]ssentially Dr. Wei has validated and shown that the human body model from MADYMO is reliable for looking at the response of the thoracic spine in snow sports accidents and contacts[,]” (Doc. 119 at 23), and “[t]he Wei group with Dr. Pierre-Jean Arnoux already validated the human body model, so I did not feel that I needed to redo that.” *Id.* at 102.¹¹

The French research study referenced by Dr. Scher, however, cautioned that it was specific to snowboarding backward falls:

Current [spinal injury (“SPI”)] analysis was only performed for snowboarding backward falls. . . . The experimental reproduction of snowboarding backward falls was the only study available for our model validation to investigate SPI in winter sports. As far as we knew, experimental reproductions of other winter-sports accidents were found nowhere else in literature. Model validation against other accident scenarios and SPI analysis for these conditions remain to be done in future works.

¹⁰ Dr. Scher testified:

Q. Dr. Scher, could you talk briefly about validation of the model here. You already talked about the work of Dr. Wei and MADYMO. What else did you do to validate this model here?

A. Sure. Yeah. The way I see it, there’s kind of like three elements, if you will. One is the human body model, which we’ve talked about quite a bit.

The second would be the actual modeling environment itself. Does the computer package, LS-DYNA and MADYMO, calculate the physics properly, the physics and engineering? And I think the answer there is an easy yes. It’s well accepted by everyone that I know of, frankly. It’s been shown over and over to do the forward equations of motion. So these are essentially expanded versions of Newton’s laws, and you take an initial condition and you integrate it forward in time. Very common, taught in undergrad and graduate schools, modeled appropriately with LS-DYNA and MADYMO. So that has been validated repeatedly. It’s used by government agencies. It’s used by companies, Ford, GM, Boeing. All of these companies use LS-DYNA and MADYMO. So that’s the modeling package.

(Doc. 119 at 57-58.)

¹¹ Because Dr. Scher’s citation to the Wei article’s validation of the MADYMO model does not constitute proper reply expert testimony or supplemental expert disclosure, the court cannot not consider it in evaluating the reliability of Dr. Scher’s computer modeling.

(Doc. 102-3 at 55.) Dr. Scher acknowledged that this statement advised against use of the model in other circumstances but concluded it did not impact his ability to rely on the French research team's validation of the MADYMO human body model for his work in this case.¹² He cited a Ph.D. thesis by Dr. Marine Dorsemayne, another member of the French research team, as an example of another researcher who has used the team's MADYMO validation work in research analyzing skier collisions with rigid objects,¹³ but he did not claim the Dorsemayne thesis is a direct validation of his own model.

Dr. Scher's reliance on other researchers' validation work to validate a model he conceded is a "novel" application¹⁴ calls into question the reliability of his opinions. He admitted that validation is the *sine qua non* of reliability. *See* Doc. 124 at 87 ("Q: . . . This is your platform, and you want to sell it to whoever or you want to write about it and you want to validate it. You would have done the testing, crash testing? A: That's true. If it was a unique platform and a unique dummy, absolutely."). He has not shown that his computer model has been "evaluated against the specific facts at issue in order to ensure that the model can reliably recreate the relevant accident at issue." *Valente*, 931 F. Supp. 2d at 424. He thus did not employ the degree of rigor in developing his computer model for his expert witness opinions that would be expected outside the courtroom. *See*

¹² Dr. Scher stated: "What they mean, and I know this from talking with Dr. Wei and Pierre-Jean Arnoux, is that if you want to use this model for, say, a skier fall and the fall kinematics before contacting, say, the snow, then you'd need an additional step. But in terms of the human body model being valid or contacting objects, no, it's valid. You don't need to do additional work." (Doc. 119 at 95.) This explanation is not included in Dr. Scher's reports.

¹³ Dr. Scher testified that he is familiar with Dr. Dorsemayne's Ph.D. thesis because was "actually on her Ph.D. committee, so [he] observed her defense and judged it." (Doc. 119 at 24.) Plaintiff argues this indicates Dr. Scher's bias.

¹⁴ Although Dr. Scher testified that engineers frequently combine LS-DYNA and MADYMO programs, he acknowledges he has never previously combined these computer modeling programs to predict thoracic spine injury nor is he aware of anyone else who has done so. *See* Doc. 119 at 67 ("Q. And you've never published a peer-reviewed article or peer-reviewed research on using computer modeling to predict a thoracic spinal cord injury in a ski accident or any other kind of accident, correct? A. That's right. Just cervical and lumbar spine."); *id.* at 68 ("Q. And isn't it true, sir, that there does not exist to date any peer-reviewed articles or published studies on how much force is required upon someone's thoracic spine to cause a spinal cord injury at the T9 level of the thoracic spine? A. As you've asked it, no.").

Kumho Tire Co., 526 U.S. at 152 (noting that the court “is to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field”).

d. Validation of the Computer Model Padding.

To accurately calculate the forces possible in a collision like Plaintiff’s, Dr. Scher’s model also needed to account for the properties of the padding attached to the snowmaking station. Although Defendants provided Dr. Scher with the padding involved in Plaintiff’s collision (the “subject padding”) and exemplar Gilman TS-2 padding (the “exemplar padding”), Dr. Scher used neither in his testing. Instead, he tested a piece of padding which he acquired at least five years ago from a ski resort in New Jersey and which he believed to be the same material as the exemplar padding. He testified that, in his experience, all Gilman TS-2 foam has the same properties after it is exposed to the elements for “a couple of years[.]” (Doc. 124 at 19.) Dr. Scher’s experience with Gilman TS-2 foam, however, is not identified in his report. His choice of materials for testing reflected his desire to preserve the exemplar padding for demonstrative evidence at trial. Again, this is not the type of scientific rigor that could reasonably be expected from an expert in the field. *See Sheehan v. Daily Racing Form, Inc.*, 104 F.3d 940, 942 (7th Cir. 1997) (explaining that *Daubert* “requires the district judge to satisfy [her or] himself that the expert is being as careful as he would be in his regular professional work outside his paid litigation consulting”).

Dr. Scher validated the padding model by comparing it to the results of testing conducted by Carley Ward and Plaintiff’s expert Mr. Penniman.¹⁵ Although Dr. Scher

¹⁵ Dr. Scher explained:

Q. Dr. Scher, could you talk briefly about validation of the model here. You already talked about the work of Dr. Wei and MADYMO. What else did you do to validate this model here?

...

A. And then I used in this case standard engineering techniques. I took the material properties of Gilman foam, measurements of the subject pad, and put

asserted that his model of the padding reproduced the results of Ms. Ward's physical testing to an acceptable degree,¹⁶ he criticized those same test results, stating: "There is insufficient information provided by Mr. Penniman for Ms. Ward's and the Gilman Corporation testing to figure out why specifically there is [a] ~54 percent increase in deceleration in Ms. Ward's testing." (Doc. 85-2 at 34.) Dr. Scher's decisions to validate his computer model by using a study about which he lacked information and which he criticized further call into question the reliability of his opinion.

e. Dr. Scher's Use of the Computer Model's Output Data to Calculate Thoracic Spine Injury Likelihood.

In addition to challenging the reliability of the model's outputs, Plaintiff argues that Dr. Scher employed a flawed methodology to calculate his Factor of Risk ratio, which predicts injury likelihood by comparing the model-generated impact loads with the average injury loads he calculated using data from published scientific literature. Pointing to Dr. Scher's acknowledgment that no peer-reviewed research has been published on the force required to cause thoracic spinal injuries like Plaintiff's, Plaintiff contends that Dr. Scher improperly scaled injury loads from the lumbar spine to the thoracic spine. Dr.

them together into a padding system, and then I look at the response and compared it to Dr. Ward's testing that Mr. Penniman used. So instead of running my own tests with a Bla[c]k Tuffy or a crash test dummy, instead of arguing about those, I decided it was okay, because I had the data from Miss Ward's testing, to look at the velocity profiles, the acceleration profiles, are we talking about the same time durations, the pole shapes, all of that, and determined that those were appropriate. The one thing I did do was because my material testing on the foam is *quasi* static, it's a slow compression test, and we know these pads respond differently with higher speeds, I used a multiplier for stiffness, which is a common technique used in mechanical engineering. It's well accepted. Everyone uses it that I know of. And I scaled the material curve for *quasi* static to the dynamic curve that would match Ms. Ward's testing.

(Doc. 119 at 57-58.)

¹⁶ As described in Dr. Scher report, Ms. Ward used a pickup truck to drive a "Black Tuffy" dummy, which consisted of molded blue rubber attached to a piece of plywood and "a single triaxial accelerometer," into a padded pole to calculate the dummy's deceleration upon impact. (Doc. 85-2 at 33.) Dr. Scher did not provide any details about the padding Ms. Ward used in her testing.

Scher notes Dr. Campbell's own use of scaling to develop child-specific injury criteria where only adult-specific data were available. He also cites two articles and a textbook that use scaling to compare the forces experienced by the lumbar and thoracic spines in his Declaration, but neither he nor Defendants provide the text of those articles. In deposition, Dr. Scher testified that he did not "know specific literature" regarding "the accuracy of scaling lumbar studies to thoracic spine injuries[.]" (Doc. 85 at 25) (internal quotation marks omitted).

Without more information regarding the basis for Dr. Scher's scaling technique, Defendants essentially ask the court to accept Dr. Scher's word that his possibly novel scaling is reliable. "The [c]ourt would not be performing its gatekeeping function, if it merely accepted, without any proof, a party's contention that its expert's opinion is reliable." *Valente*, 931 F. Supp. 2d at 422. Absent proof that Dr. Scher's scaling to calculate the injury loads of the thoracic spine is supported by peer-reviewed literature or generally accepted in the biomechanical engineering community, Dr. Scher's Factor of Risk calculations do not comport with Rule 702's reliability requirements. *See also Valente v. Textron, Inc.*, 559 F. App'x 11, 13 (2d Cir. 2014) (quoting *Zerega Ave. Realty Corp. v. Hornbeck Offshore Transp., LLC*, 571 F.3d 206, 213-14 (2d Cir. 2009)) ("[I]t is well-settled that where, as here, a trial judge finds that assumptions underlying expert testimony 'are so unrealistic and contradictory as to suggest bad faith or to be in essence an apples and oranges comparison,' it has the discretion to exclude the testimony.").

For the foregoing reasons, Dr. Scher's computer modeling opinion is unreliable and inadmissible under Rule 702.

2. Whether Dr. Scher's Computer Modeling Opinion Is Admissible Under Fed. R. Evid. 403.

Even if the court had decided Dr. Scher's computer modeling was admissible under Rule 702, under Rule 403 the court must analyze whether the danger of unfair prejudice or confusing the issues substantially outweigh the probative value of Dr. Scher's computer model. Here, the probative value of Dr. Scher's novel application is not particularly robust in light of his lack of validation; however, its highly technical,

seemingly “scientific” presentation has a significant potential to confuse a jury. “Expert evidence can be both powerful and quite misleading because of the difficulty in evaluating it.” *Daubert*, 509 U.S. at 595; *see also Nimely*, 414 F.3d at 397 (noting the “unique weight such [expert testimony] may have in a jury’s deliberations”). In light of the novel and untested application and the significance of the opinion he seeks to offer to the jury, his computer model will not be helpful to the jury and has a substantial risk of misleading jurors into believing that a model created by a well-qualified engineer has more predictive certainty than Dr. Scher’s own research has demonstrated.

Under Rule 403, the probative value of his opinions regarding computer modeling is substantially outweighed by the potential for juror confusion. In addition, there would be unfair prejudice to Plaintiff from an untested “scientific” analysis of his skiing speed where scant evidence of that speed is otherwise present in this case. Dr. Scher’s computer modeling is inadmissible for this reason as well. *See Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997) (“[N]othing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert. A court may conclude that there is simply too great an analytical gap between the data and the opinion proffered.”).

For the foregoing reasons, Plaintiff’s motion to exclude Dr. Scher’s computer model and the opinions based on it is GRANTED.

E. Whether Dr. Scher’s Opinion Regarding the Limitations of Ski Padding Systems Must Be Excluded.

Dr. Scher opined: “[a]ll ski area[] padding systems have limitations (for example, finite energy attenuation capabilities) and cannot prevent all injuries when contacted by a snowsport participant.” (Doc. 85-2 at 39.) Based on his “experience testing padding used at ski areas and [on] data from scientific presentations at ski safety meetings,” Dr. Scher stated that typical padding systems used at ski resorts could absorb “less than a few hundred joules” from an impact, leaving enough energy to produce significant injury. *Id.* at 31. According to Dr. Scher,

at the speeds and energies associated with beginner skiers on trails of

similar slopes to Lower Mountain Road, the Gilman TS-2 padding system would have produced a low likelihood for [Plaintiff]’s injuries; that is, the padding would be effective in preventing severe injury at contact from a person traveling at beginner skier speeds.

Id.

If Plaintiff had been traveling at eighteen miles per hour, Dr. Scher opined that Plaintiff would have struck the padding with more than 2,600 joules of kinetic energy. He concluded that because of the limits on the amount of energy that ski area padding can absorb, at this speed, “there would be sufficient energy remaining to produce significant injuries even if the padding was attached in a more rigid fashion to the subject padded HKD snowmaking equipment; alternate padding application or position would not have modulated the outcome of the subject accident.” *Id.*

Defendants contend that because Plaintiff does not challenge the admissibility of Dr. Scher’s opinions related to the limitations of ski trail padding systems, Plaintiff’s motion “cannot preclude Dr. Scher from offering his unchallenged opinions at trial.” (Doc. 102 at 15.) The court’s gatekeeping role under Rule 702 is not confined to admissibility challenges raised by the parties. *See Daubert*, 509 U.S. at 588 (“[U]nder the Rules [of Evidence] the trial judge must ensure that *any and all* scientific testimony or evidence admitted is not only relevant, but reliable.”) (emphasis supplied); *Kumho Tire Co.*, 526 U.S. at 147 (expanding *Daubert*’s “gatekeeping obligation” under Rule 702 to “all expert testimony”); *Fraser v. Wyeth, Inc.*, 992 F. Supp. 2d 68, 97 (D. Conn. 2014) (observing that “the Court had the authority to raise *Daubert* concerns *sua sponte*”); *see also United States v. Beigel*, 370 F.2d 751, 756 (2d Cir. 1967) (observing that there is a “duty of the federal courts to make an independent inquiry concerning the admissibility of evidence in federal cases”).

Dr. Scher opined: “[i]n order for a padding system to reduce the likelihood of injury to Mr. Grajeda, it would have needed to reduce his energy significantly such that Mr. Grajeda’s body attenuated less energy than needed for injury.” (Doc. 85-2 at 31.) Based on his research finding that ski trail padding can attenuate less than several hundred joules of kinetic energy, he estimated that if Plaintiff was sliding at eighteen

miles per hour when he contacted the snowmaking gun, the padding would not have absorbed enough energy to prevent severe injury. A representative of the Gilman Corporation, however, has testified she is unaware of a single skier who has collided with properly placed Gilman padding and sustained serious injury. Dr. Scher does not attempt to discredit or explain this deposition testimony.

“If the witness is relying solely or primarily on experience, then the witness must explain how that experience leads to the conclusion reached, why that experience is a sufficient basis for the opinion, and how that experience is reliably applied to the facts.” Advisory Committee Notes, 2000 Amendments, Fed. R. Evid. 702. Because Dr. Scher’s opinion regarding the energy attenuation limitations of Gilman TS-2 padding is drawn from his experience researching that topic, he may opine that at certain skiing speeds neither the Gilman TS-2 padding nor any other type of padding will prevent significant injuries. Plaintiff is free to cross-examine Dr. Scher with evidence to the contrary. Dr. Scher may not, however, opine that Plaintiff was skiing at a particular speed when the underlying facts do not support that contention and when his computer modeling is inadmissible and does not support it.

For the foregoing reasons, Plaintiff’s motion to exclude Dr. Scher’s opinions regarding padding limitations in preventing certain injuries is GRANTED IN PART and DENIED IN PART.

F. Whether Dr. Scher’s Alternative Explanation for How Plaintiff Came to Rest Next to the Snowmaking Station Base Must Be Excluded.

In response to a question by Plaintiff’s counsel during a deposition, Dr. Scher testified that Plaintiff could have come to rest next to the snowmaking gun pole despite having struck the padding:

Q. So, explain for me, Dr. Scher, that if you’re saying that [Plaintiff] could not have slid under the pad and struck the pole, how is it that he ended up . . . against the pole if he didn’t slide under the padding?

A. Sure. Absolutely. So, as [Plaintiff] contacts the padded pole – and we know from the dimensions of the pad, the gun, the approximate size of [Plaintiff], that there wouldn’t be space for him to completely go under the pad. He interacts with the pad during his contact. During that contact,

there's going to be a radio component toward the center of the HKD base pole, and there's going to be a tangential component. As he contacts and compresses the cylinder into a more oval shape, or at least one of them starts to wrap around it and created his injuries, that pad is also going to not just compress, but rotate around the pole. As the bottoms hit and the top ones come out, it can then – if the buckle breaks – fall on top of him, so he's actually under it at the end of the event. Alternatively, if – and I remember there was testimony that they had to lift the pad up and over him. Because of the contour of the snow, if he's against part of the pad part – part of the pole at the end, they lift it up and out, he can slide down next to the pole at the very end.

(Doc. 85-3 at 261-62.) Dr. Scher stated that this opinion was not part of his initial report and not based on his computer modeling work or other simulations or testing, but rather was “just physics. That’s Newton’s and Euler’s laws. Yeah. That’s classic Newton physics.” *Id.* at 263.

Although Plaintiff challenges Dr. Scher’s deposition testimony regarding how Plaintiff could have hit the padding but come to rest against the snowmaking gun’s metal pole as speculative, he does not challenge the scientific validity of the laws of physics underpinning his opinion which are generally accepted in the scientific community. Plaintiff instead contends that when Dr. Campbell ran the model, it showed that the human body model “bounced off the padding” away from the pole after impact, contradicting Dr. Scher’s testimony. (Doc. 85 at 22.)

Because the computer model was designed to simulate only the 100 to 120 milliseconds of impact, the model’s results when it is run for a longer time do not contradict Dr. Scher’s explanation. Nevertheless, “[a]n expert opinion requires some explanation as to how the expert came to his conclusion and what methodologies or evidence substantiate that conclusion.” *Riegel v. Medtronic, Inc.*, 451 F.3d 104, 127 (2d Cir. 2006), *aff’d*, 552 U.S. 312 (2008). Dr. Scher did not explain how he applied Newton’s and Euler’s laws, and his testimony “essentially provided no explanation of how he had reached his conclusion[.]” *Id.* Lay jurors may be incapable of filling in the gaps and may have no in-depth understanding of the laws of physics he relies on. Dr. Scher’s opinion is therefore unhelpful to the jury in determining the facts of this case. *See*

Fed. R. Evid. 702 (requiring an expert witness to “appl[y] the principles and methods reliably to the facts of the case” and requiring the court to find the resulting opinion will “help” the jury).

The court therefore GRANTS Plaintiff’s motion to exclude Dr. Scher’s alternative explanation for how Plaintiff could have struck the padding but come to rest next to the snowmaking gun pole.

G. Whether Dr. Scher’s Rebuttal of Mr. Penniman’s Opinions Must Be Excluded.

Dr. Scher offered a rebuttal opinion responding to the opinions of Plaintiff’s expert Mr. Dick Penniman that a skier could not have been injured by hitting a properly installed Gilman TS-2 pad, that Defendants should have employed alternative padding or barriers to prevent skiers from colliding with the snowmaking gun, and that ASTM International has established safety criteria for ski area padding. He offers the following criticism:

Mr. Penniman’s logic and opinions regarding the condition and set up of the subject Gilman TS-2 padding system before and during the accident are complete speculation. Mr. Penniman conducted no analysis and his bases/logic are flawed for his conclusions regarding whether or not [Plaintiff] contacted the subject padding, the HKD snowmaking gun base (metal pole), or both.

(Doc. 85-2 at 39.) He further opined that to his knowledge as an active ASTM International member and the former chair and current vice-chair of the ASTM F27 committee which sets snow sport standards, he is unaware of any ASTM International or International Standards Organization snow sport standards governing ski area padding.

Dr. Scher criticized Mr. Penniman’s conclusions regarding the circumstances of Plaintiff’s collision as speculative and baseless. In an Entry Order dated March 23, 2023, this court significantly limited Mr. Penniman’s testimony and excluded his opinion that Plaintiff’s injuries were caused by striking a metal pole. Dr. Scher’s rebuttal testimony responding to those excluded opinions is thus no longer relevant. *See* Fed. R. Evid. 702. Plaintiff’s motion to exclude Dr. Scher’s rebuttal opinion is therefore GRANTED.

CONCLUSION

For the foregoing reasons, Plaintiff's motion to exclude Defendants' expert Dr. Irving Scher (Doc. 85) is GRANTED IN PART and DENIED IN PART.

SO ORDERED.

Dated at Burlington, in the District of Vermont, this 27th day of July, 2023.

A handwritten signature in black ink, appearing to read 'Christina Reiss', is written over a horizontal line.

Christina Reiss, District Judge
United States District Court